Vol. 77, Part 3, pp. 398–402, 2 Figures.

Petalochilus Rog. and the New Zealand Forms of *Caladenia* R. Br.

By EDWIN D. HATCH, Laingholm, Auckland, S.W.4.

[*Read before the Auckland Institute, October 22, 1947; received by the Editor, January 14, 1948; issued separately, May, 1949.*]

ACKNOWLEDGMENTS.

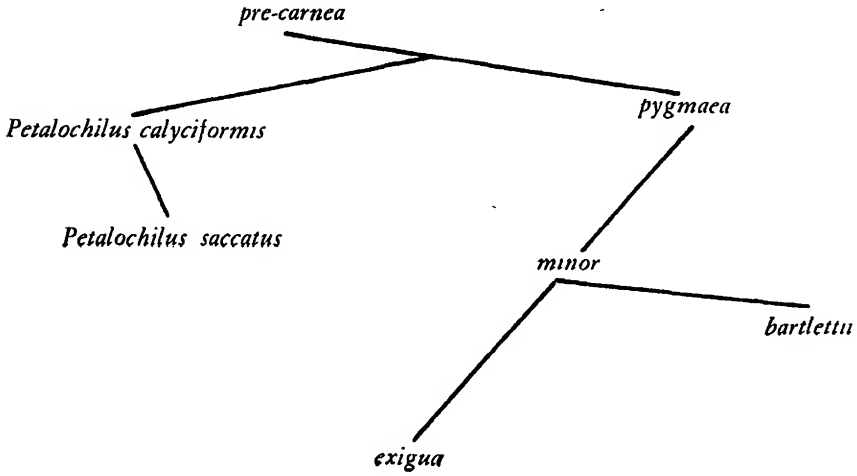
THE writer is indebted to Miss C. M. Eardley, of Adelaide, for syntypes and photographs of *Petalochilus,* to Mr. George Simpson, of Dunedin, for living specimens of *Caladenia lyallii,* and to Mr. F. W. Bartlett, of Silverdale, who assisted with *C. carnea.*

PETALOCHILUS

Little more is known of this genus than was recorded by Rogers in the original descriptions and illustrations. There is no point then in repeating his observations, especially since his paper has been reprinted in *Transactions* and so is readily available to local students.

Petalochilus is considered to be a local development, probably derived from an early form of *Caladenia carnea.* The undifferentiated labellum is not of itself important. The specialised labellum of the average orchid is a petal adapted to the requirements of pollination. When that function is taken over by another organ (as happens in *Petalochilus*) the labellum falls into disuse and thence into decline, reverting in this instance to its original petaloid condition. *Petalochilus* then appears to be a retrograde to *Caladenia* rather than the representative of a primitive form. Nicholls (*Vict. Natr.,* 61, 1945, 207; figs. k, l, m) has unconsciously demonstrated that *Caladenia* could give rise to such a form as *Petalochilus.* He describes a couple of teratological specimens of *Caladenia menziesii* R. Br. in which the labellum has become petaloid, although still retaining vestigal calli,

TEXT FIGURE 1.



and the column-wings have fused to form a cavity embracing the lower two-thirds of the column. The staminoid appendage. which distinguishes *Petalochilus* is, however, absent in these *Caladenia* specimens.

Petalochilus saccatus is probably derived from an early form of *P. calyciformis* by a fusion of the column-wings with the staminoid appendage.

Petalochilus Rog.

An endemic genus of 2 closely related species.

1. **Petalochilus calyciformis** Rog. *Journ. Bot.*, March, 1924, 66, t. 571; *Trans. N.Z. Inst.*, 56, 1926, 16, t. 4, figs. 1–3.

Distribution: 2, Kaitaia, 10, 1912–16, *H. B. Matthews.*

Holotype in the herbarium of the University of Adelaide—Kaitaia, 11, 1916, H. B. Matthews.

2. **Petalochilus saccatus** Rog. *Loc. cit.*, figs. 4–7.

Distribution: 2, Kaitaia, 10, 1912–23; Ahipara, 11, 1927, *H. B. Matthews.*

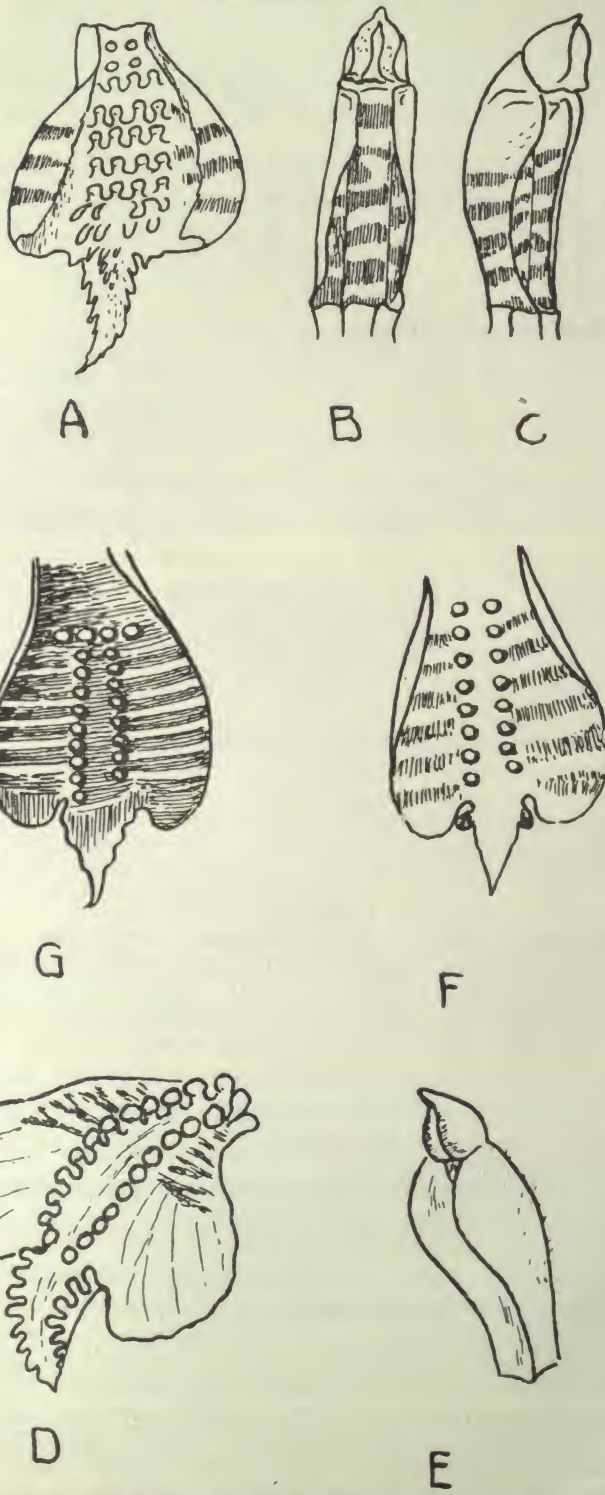
Holotype as above—10, 1912.

Syntypes of both species are in the writer's collection, other specimens in the Auckland Museum and in the Sydney National Herbarium (Rupp Collection). Rogers' illustrations, quoted above, can be regarded as the hypotypes of the species. Large colonies in *Leptospermum* scrub. Very local. It may be worth recording here that the negatives of Matthews' invaluable photographs (which include *Petalochilus* and many other orchids now extremely rare) are also held by the Auckland Museum. Some years ago Dr. Archey very kindly arranged for a complete set of prints to be taken off, and these have been of the greatest assistance to the writer in preparing these papers.

CALADENIA R. Br.

Terrestrial, more or less pubescent herbs with small globular tubers. Leaf solitary, usually basal, varying from linear to lanceolate. Stem and floral bracts similar, small. Flowers either solitary or as many as 6 in a terminal raceme. Perianth segments more or less similar, narrow-ovate or elongated into filiform caudae. Dorsal sepal erect or cucullate. Lateral spreading or reflexed. Petals similar but rather shorter. Labellum on a movable claw, usually trilobate, rarely undivided. Disc with numerous stipitate or sessile calli, arranged in rows or more rarely irregular. Lateral lobes incurved to embrace the column, midlobe triangular, brightly coloured, with or without marginal calli. Column rather long, incurved, winged above. Anther terminal, oblique, rostrate, valvate, 2-celled. Pollinia 4, pollen granular. Caudicle absent. Stigma discoid, high beneath the anther.

A genus of some 75 Australian species; 1 extends to Java, another to New Caledonia, and 2 to New Zealand. Both the New Zealand species belong to Bentham's section *Eucaladenia,* in which the perianth segments are never filiform. It is believed that those species in which the labellum has 4 rows of calli represent a more primitive type than those in which only 2 rows occur. Some 2-rowed species occasionally begin to form 4 rows, then change abruptly to 2. The irregular calli formation, now rare, is probably the most primitive.



(*a*) *Caladenia lyallii*, labellum. (*b*, *c*) *C. lyallii*, column. (*d*) *C. carnea* var. *minor*, labellum. (*e*) *C. carnea* var. *minor*, column. (*f*) *C. carnea* var. *exigua*, labellum. (*g*) *C. carnea* var. *bartlettii*, labellum.

As a genus *Caladenia* is rather prone to revert, and odd types crop up now and then which show definite ancestral features. *Caladenia* is adapted for insect pollination, but in New Zealand is usually self-fertile and even occasionally cleistogamous. Probably windborne originally across the Tasman.

KEY TO THE NEW ZEALAND SPECIES.

1.	Labellum with 4 rows of calli	*lyallii*
	Labellum with 2 rows of calli	*carnea*...2
2.	Midlobe with several marginal calli, flowers white, green or pink	var. *minor*
	Midlobe with only one large marginal callus, flowers pink ..	var. *exigua*
	Midlobe with no marginal calli, flowers dark glazed mauve .	var. *bartlettii*

1. **Caladenia lyallii** Hook. f. *Flor. Nov. Zel.*, 1, 1853, 247.
C. alpina Rog. *Trans. R S. South Austr.*, 51, 1927, 12.

Up to 30 cm. high. Leaf broad-linear, up to 17 cm. long by 4 mm. broad. Flowers 1–2, large, white or pink. Dorsal sepal cucullate, acute or obtuse. Lateral and petals similar, spreading. Labellum obscurely 3-lobed, conspicuously marked with transverse pink striae, or rarely spotted. Disc calli in 4 rows, either stipitate or linear, usually yellow, occasionally fading to white. Column marked with red, wings rather prominent.

Distribution: Australia—N.S.W., Victoria, Tasmania—not common. New Zealand—*5*, between Taupo and Rangitaiki, 1, 1933, *K. W. Allison; 9; 10; 11; 12a; 13; 14; 15*—not uncommon throughout in subalpine areas. Descends to sea-level in the Auckland Islands. Cheeseman (*Manual*, 1906, 688) records it from Stewart Island, but Smith, in spite of thorough searching, has been unable to locate it there in recent years. If it occurs at all, it must be rare and very local.

Flowers Nov.–Jan., sea-level–4,000 ft.; large colonies in tussock or in scrub.

2. **Caladenia carnea** R. Br. *Prodr.*, 1810, 324.

A highly compound species of at least 12 jordanons, 8 of which have been given varietal names. It occurs over most of Australia (except Westralia) and extends to Java and to New Zealand. The principle followed in dealing with this species is the same as that followed previously in reviewing *Corybas* and allows that varietal rank is only warranted where there is distinct true-breeding morphological variation, and that jordanons composed solely of colour-forms, even where breeding true, must be included under the name of the form from which they have supposedly derived.

(a) *Caladenia carnea* var. **minor** (Hook. f.) Hh. *Trans. R.S.N.Z.*, 75, 1945, 368.
C. carnea var. *pygmaea* Rupp. *Proc. Linn. Soc. N.S.W.*, 69, 1944, 74 (non Rog.).
C. minor Hook. f. *Fl. Nov. Zel.*, 1, 1853, 247, t. 56 b.
C. variegata Col. *Trans. N.Z. Inst.*, 17, 1885, 248.

Jord. (i) Up to 30 cm. high. Leaf narrow-linear, up to 20 cm. long by 2 mm. broad. Flowers 1–5, white or pink. Perianth segments more or less similar, the dorsal sepal erect, the others spreading. Labellum 3-lobed, marked with transverse purple bands. Disc with 2 rows of stipitate or linear calli. Midlobe with *several* marginal calli. Callus-tips yellow, occasionally fading to white. Column erect or inclined, marked with transverse purple bands,

Distribution: Australia—N.S.W., not common. New Zealand—abundant throughout both main islands and extending to Stewart Island.

Flowers Oct.–Jan., sea-level–3,000 ft.; mossy open places in scrub. small colonies or scattered. Hooker's illustration (*Fl. Nov. Zel.*, 1, 1853, 247, t. 56 b) can be regarded as the hypotype of the variety.

Jord. (ii) Similar to (i) in general morphology, differing in the flower being dark green, with red pubescence, the dorsal sepal strongly cucullate and the labellum disc, midlobe and *all* the calli a dark chocolate-brown.

Distribution: Endemic—*3a,* Glen Eden, 10, 1928, *H. B. Matthews* (MSS. name "C. calliniger"); Titirangi, 10, 1929, *H. Carse;* Laingholm, 10, 1947, *E. D. Hatch; 3c,* Kennedy's Bay, 10, 1929, *H. B. Matthews.**

(b) *Caladenia carnea* var. **exigua** (Cheesmn.) Rupp. *Proc. Linn. Soc. N.S.W.*, 69, 1944, 75.
C. exigua Cheesmn. *Trans. N.Z. Inst.*, 45, 1913, 96.
C. minor var. *exigua* Cheesmn. *Manual*, 1906, 688.

Superficially similar to var. *minor*, smaller, the flowers almost always pink and the perianth segments, particularly the petals, rather broad. Midlobe of the labellum with only *one* large marginal callus on either side.

Distribution: Australia—Tasmania, N.S.W., not uncommon. New Zealand—*2, 3a, b,* occasional throughout in mossy scrub; *5,* Rotorua, 10, 1924, *K. W. Allison.*

Flowers Sep.–Oct., sea-level–2,000 ft.

(c) *Caladenia carnea* var. **bartlettii** Hh., *var. nov.*

Caladenia carnea minor affinis, subsimilis. Differentis in paucis pubescens, in color pulli-viridis, in flores pulli-purpurei nitidi exceptentis pollinia, apices callorum et lobum medium, quod lucidiflavus. Lobum inaequaliter sinuosus et nullus calli marginem.

Related to, and probably derived from, var. *minor*, but only sparsely pubescent, dark purplish-green and the whole flower a dark glazed mauve, except the pollinia, the tips to the disc calli, and the midlobe, which are contrastingly bright yellow. Midlobe irregularly sinuate and *without* marginal calli.

Distribution: Endemic—*2,* "Northern counties in vicinity of Kauri trees," *H. B. Matthews* (MSS. name, "C. nitidoa-rosea"); *3a,* Silverdale, 10, 1946–7, *F. W. Bartlett;* Birkdale, 11, 1946, *E. D. Hatch.*

Flowers Oct.–Nov., scattered in gumlands scrub associations or more rarely about the roots of large kauri. The writer is glad to be able to acknowledge, in this new variety, the work of Mr. Frank W. Bartlett, of Silverdale, whose knowledge of the gumlands flora has made his home the mecca of Auckland enthusiasts for many years.

Holotype in Herb. Hatch, No. 567, Wade River, Silverdale, 8.10.1947, *F. W. Bartlett.* The accompanying figure can be regarded as the hypotype of the variety.

ADDITIONAL REFERENCES.

NICHOLLS, W. H., *Vict. Natr.*, 64, 1947, 135 t.
RUPP, H. M. R., *Proc. Linn. Soc. N.S.W.*, 71, 1947, 278.

* Since writing the above, *Caladenia carnea minor*, Jordanon ii, has been discovered at Silverdale, 10.1947, *F. W. Bartlett.*